

THE EU AND THE NUCLEAR INDUSTRY MUST WORK TOGETHER TO ACHIEVE A PROSPEROUS AND CARBON-NEUTRAL EUROPE BY 2050

Meeting the EU's ambition to decarbonize its economy will require significant investment in all low-carbon technologies. This means investing in Europe in both the long-term operation of the existing nuclear fleet and the construction of substantial new nuclear capacity (around 100GW of nuclear new build).

The nuclear industry will strive to:

- Deliver the required volume of nuclear capacity on time and at a competitive cost
- Undertake research, development and innovation activities in Europe to identify areas where the nuclear industry can help decarbonise other sectors
- Contribute to ensuring security of energy supply
- Continue to manage used nuclear fuel and radioactive waste in a responsible manner
- Invest in and maintain human capital
- Build a strong European foundation to export nuclear technologies and skills to overseas markets.

And it recommends that the EU:

- Agree an ambitious net-zero CO2 emissions target for the EU in 2050
- Ensure a coherent, consistent and stable EU policy framework (including for Euratom)
- Implement an investment framework that incentivizes investments in all competitive, low carbon options
- Support a stable low carbon energy mix which can accommodate the increased share of renewable energy generation
- Develop and implement a strong industrial strategy to ensure that Europe maintains its technological leadership
- Support human competences.

NUCLEAR INDUSTRY IN NUMBERS



Accounts for
26%
of electricity in the EU



Almost
50%
of low-carbon electricity



Supports around
1.1 Mn
jobs



Turnover of
102bn
per year

WHY NUCLEAR?

Nuclear energy clearly contributes to EU climate and energy objectives

Nuclear energy is low-carbon

The overwhelming majority of international bodies, scientists and policymakers agree that climate change is one of the biggest challenges facing the world today. Impacts are already being seen, and the public is calling for urgent action to avoid serious long-term consequences.

1. Nuclear energy is internationally recognized as a crucial asset in the fight against **climate change**:
2. The latest Intergovernmental Panel on Climate Change (IPCC) report (Global Warming of 1.5°C, of 8 October 2018) makes it clear that nuclear power is essential if the world is to keep global warming to below 1.5 degrees¹.
3. According to the IEA (Nuclear Power in a Clean Energy System, 28 May 2019²) a steep decline in nuclear power would threaten energy security and climate goals, and could result in billions of tonnes of additional carbon emissions.

The European Commission's "A Clean Planet for All" strategic vision recognises that nuclear, together with renewables, will form the backbone of a carbon-free power sector in 2050³.

Today, nuclear energy accounts for more than half of the low-carbon power generated in the EU and is by far the largest source (wind provides 11%, hydro 10% and solar 4%). It **is also the primary electricity source** (26% of the EU power mix⁴, followed by coal, 21% - and gas, 20%)

Nuclear energy helps ensure **security of supply**

Nuclear plays a key role in ensuring **security of energy supply** in Europe:

- Identified resources of uranium are sufficient to support continued use and significant growth of nuclear for well over 120 years.
- With an availability factor of at least 90%, nuclear power plants produce large amounts of "dispatchable" power, ensuring grid stability. Nuclear power plants are also technically capable of operating in flexible mode, making them the perfect partner for variable renewables.

¹"Nuclear power increases its share in most 1.5°C pathways with no or limited overshoot by 2050" https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter2_Low_Res.pdf

² <https://www.iea.org/publications/nuclear/>

³ "By 2050, more than 80% of electricity will be coming from renewable energy sources (increasingly located off-shore). Together with a nuclear power share of ca. 15%, this will be the backbone of a carbon-free European power system." https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf

⁴ <https://ec.europa.eu/eurostat/en/web/products-eurostat-news/-/DDN-20180504-1>

Nuclear energy is **sustainable**

In addition to being low-carbon, nuclear also has several other **environmental benefits**

- Nuclear electricity production emits, during the whole fuel cycle, very limited GHG and other air pollutants, compared to other sources of energy.
- The land required to produce electricity is significantly lower than other energy sources (for a 1,800 MW plant, nuclear requires 4km², wind 437km² and solar 56km²)
- Nuclear is responsible for a very small amount of the total hazardous waste that is produced by society across the world today and that is dealt with in a highly responsible manner under the Euratom legal framework (i.e. approx. 54kg of hazardous waste are produced per person, per year; of that total, approx. only 54g per person, per year, is radioactive waste).

Nuclear is **competitive**

- The Long-Term Operation (LTO) of existing nuclear reactors has the lowest LCOE (Levelized Cost of Electricity) of all technologies.
- Nuclear ensures wholesale price stability because it is less affected by potential fuel price spikes.
- Uranium fuel costs are marginal in terms of the total cost of electricity and have limited impact on overall production costs.

Nuclear **contributes** to EU **growth and jobs** creation

- As a strategic industrial sector maintaining an EU-based industrial capacity and contributing to local economic development nuclear offers much in terms of **economic and social sustainability**. The nuclear sector provides long-term skilled jobs (1.1 million), generates more than half a trillion euros in GDP, and offers substantial export potential.
- The European nuclear sector holds technology leadership across all segments of the nuclear value chain, which it develops through R&D and innovation.

ACHIEVING EUROPE'S DECARBONISATION GOALS - TOGETHER

Europe has set itself demanding decarbonisation goals. Whilst these will be challenging, they can be achieved by working together.

Meeting the EU's ambition to decarbonize its economy will require significant investment in all low-carbon technologies.

This means investing in Europe in both the long-term operation of the existing nuclear fleet and the construction of substantial new nuclear capacity (around 100GW of nuclear new build). Both are achievable if EU institutions, Member States and the European nuclear industry work together in partnership.

Our pledge

The European nuclear industry is committed to help overcome the challenges facing Europe. In addition to continuing to build, operate, maintain and decommission nuclear reactors and other nuclear facilities in full compliance with nuclear regulatory requirements and international standards, the industry will strive to:

1. Deliver the required volume of nuclear capacity on time and at a competitive cost, in line with the latest forecasts concerning the share of nuclear in the future low-carbon energy mix. To achieve this, the industry will work closely with the supply chain to maximize the benefits of replicating new build projects and ensure the development of the technology required.
2. Undertake research, development and innovation activities in Europe to identify areas where the nuclear industry can help decarbonise other sectors, such as industry, heating and transport.
3. Contribute to ensuring security of energy supply: by implementing appropriate nuclear fuel supply policies aligned with Euratom requirements, by joining forces (where relevant) to develop new EU technology leaderships and partnerships in the EU and global supply chains, and also by fostering cooperation with power regulators to further optimize the contribution of nuclear plants to the stability of the EU power grid.
4. Continue to set the standard for safety in the energy sector, continue to manage used nuclear fuel and radioactive waste in a responsible manner, to take decisions which will limit the impact on future generations and to invest in research to identify additional solutions for such waste. These include technologies to reduce the volume and toxicity of such waste, to reuse used fuel or the waste generated, to reduce its radioactive lifetime, and to finally dispose any residual waste.
5. Invest in and maintain human capital. We will work closely with national and local governments and other stakeholders to render the industry more attractive to young people and to ensure the sector has the highly skilled workforce it needs.
6. Build a strong European foundation to export nuclear technologies and skills to overseas markets.

Our recommendations

The European nuclear industry is committed to making an important contribution to achieving the EU's climate and energy goals. However, this requires the following actions from our EU partners:

Agree an ambitious net-zero CO2 emissions target for the EU in 2050, in line with the European Commission's long-term vision for a climate neutral economy.

- Agree a climate neutrality target for the EU in 2050, including a cost-efficient path towards it through an increased EU mid-term (2030) CO2 reduction target, and related ambitious CO2 reduction target for the electricity sector by 2040.

Ensure a coherent, consistent and stable EU policy framework (including for Euratom).

- ALL low-carbon technologies should be prioritized, promoted and supported equally by the EU institutions.
- Fully integrate nuclear into all energy policy discussions, particularly those relating to the EU's decarbonization goals.
- Ensure coherence between policies – for example, policies aimed at achieving climate goals should support all low-carbon technologies recognised in the EU's "A Clean Planet for All" communication.
- Address market failures.

Implement an investment framework that incentivizes investments in all competitive, low carbon options.

- Develop and implement a market framework which can offer investors' confidence and encourage investment in all low carbon power generation projects.
- Ensure that EU financing initiatives (e.g. InvestEU, Sustainable Finance, EIB lending policies) support all low carbon technologies.
- Allow equal market access and support for all forms of low carbon generation. This will enable a more sustainable and cost-effective energy mix and reduce the need for non-market support schemes.
- Establish an effective carbon price signal to drive investments into mature low carbon technologies.

Support a stable low carbon energy mix which can accommodate the increased share of RES generation

- Recognize nuclear's role in providing grid stability through both dispatchable and flexible operation.
- Ensure that the electricity market values the services needed to maintain security of energy supply by compensating the providers of these services, including nuclear power plants, in a competitive and non-discriminatory manner.

Develop and implement a strong industrial strategy to ensure that Europe maintains its technological leadership

- Provide significant support to innovation, research and development. Increase funding for research into both current and future nuclear technologies such as Small Modular Reactors and using nuclear to produce, for example, heat and hydrogen.
- Support supply chain optimization efforts e.g. through standardisation.
- Promote, together with regulators, a better alignment of licensing and regulatory processes, and contribute to more harmonization across the EU nuclear sector.

Support human competences

- Assist in attracting young people to this industry. To do this, and in line with other international organisations, the EU should be more vocal on the fact that nuclear has a future in the 2050 low-carbon economy.
- Policymakers, educational systems and industry should work together to ensure generation transition and competence transfer, as well as to help the workforce adapt to new technologies (digitalization, industry4.0).

MANIFESTO
#NuclearEuropeLeaders



Roberto Adinolfi

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Philippe Stohr

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CEZ GROUP

Bohdan Zronek

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Philippe Sasseigne

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Xavier Ursat

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Paul Spence

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Yuriy Nedashkovsky

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Thierry Saegeman

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Toni Hemminki

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Tiina Tuomela

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Bernard Fontana

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KOZLODUY NPP

Nasko Mihov

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Csaba Kiss



Tim Stone

Tom Greatrex



Paul Howarth



Cosmin Ghita



Philippe Knoche

Philippe Knoche



Philippe Renault



Robert Leclère



Francisco Javier Guerra



Jarmo Tanhua



Johan Svenningsson



Dominic Kieran

Ad Louter



Magnus Hall



José Emeterio Gutiérrez

About us

The European Atomic Forum (FORATOM) is the Brussels-based trade association for the nuclear energy industry in Europe. The membership of FORATOM is made up of 15 national nuclear associations and through these associations, FORATOM represents nearly 3,000 European companies working in the industry and supporting around 1.1 million jobs.



Avenue des Arts 56
1000 Brussels
tel +32 2 502 45 95
foratom@foratom.org
www.foratom.org

@FORATOM_nuclear



@FORATOMnuclear



FORATOM

